

September 11, 2017

STATE PROJECT: 38457.1.2 (B-4662)

COUNTY: Wake

DESCRIPTION: Bridge No. 196 on SR 2308 (Fowler Rd) over Moccasin Creek

SUBJECT: Geotechnical Report – Inventory

Project Description

This project consists of the construction of a new single-span bridge over Moccasin Creek. The project also includes improvements and partial realignment of the existing two-lane roadway (-L-). Roadway improvements will entail grade adjustment to the roadway and adjacent slopes/ditches with cuts and fill up to 8 feet and 4 feet, respectively.

The geotechnical fieldwork was conducted in August of 2017. The drilling activities were conducted by Catlin Engineers & Scientists based in Wilmington, North Carolina, and overseen by Stewart. A truck-mounted CME-45B drill machine with an automatic hammer was used during the subsurface exploration. In total, six soil test borings with Standard Penetration Tests (SPT) were performed at selected locations along the alignment to evaluate subsurface conditions. This included two borings at each end bent and two borings along the roadway portion of the project. Soil samples were collected and visually classified in the field by a geotechnical engineer from Stewart. No laboratory testing was performed.

The following alignment, totaling 0.26± miles was investigated:

<u>Alignment</u> <u>Stations</u>

-L- 10+00 to 23+90.00

Physiography & Geology

The project is located in northern Wake County, at its border with Franklin County. The surrounding land is primarily wooded and swamp/marsh.

Geologically, the site is underlain by Raleigh Belt of the Piedmont Geologic Province of North Carolina. This area is characterized by foliated to massive granitic rock from the Pennsylvanian to Permian Period.

Soil Properties

Soils encountered at the site include roadway embankment, alluvial, and Piedmont residual soils. The roadway embankment consists of moist, loose to medium dense, silty sand (A-2-4). This material is associated with the construction of Fowler Rd. Alluvial soils related to Moccasin Creek were encountered at the bridge crossing. The alluvium consists of wet to saturated, very loose to loose, silty sand (A-2-4) and saturated, very soft to soft, sandy clay (A-6). The native residual soil consists of moist to wet, loose to medium dense, silty sand (A-2-4).

Rock Properties

Five of the six borings encountered granite at depths ranging from 6.3 to 14.8 feet below the existing ground surface. However, it is prudent to note that rock elevation can be very erratic, even over short discuses, and it is not uncommon to find isolated rock pinnacles or outcrops in this area of Wake County. Granite is this area is very competent and difficult to excavate. Also, there is often a layer of weathered rock present between the bedrock and overlying soil, as was encountered in one of the bridge borings (EB1-A).

Groundwater

Groundwater was encountered in several borings along the proposed alignment. Depths to groundwater ranged from approximately 3 feet to 7.5 feet below the current ground surface. Groundwater may to impact construction of the new roadway alignment in cut between Sta. $20+75\pm$ and $22+25\pm$ -L-.

Areas of Special Geotechnical Interest

Rock – The following sections were found to contain rock above or within 6 feet of the proposed grade:

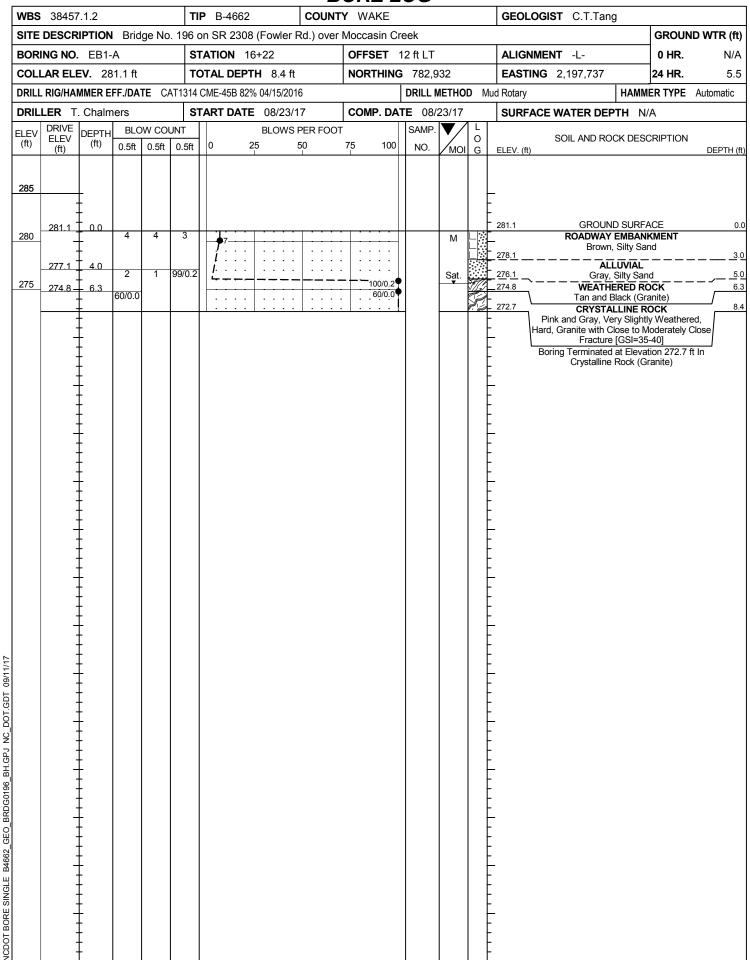
<u>Alignment</u>	<u>Stations</u>	Offset (ft)
-L-	20+75± to 22+75± -L-	25± ft LT to 30± ft RT

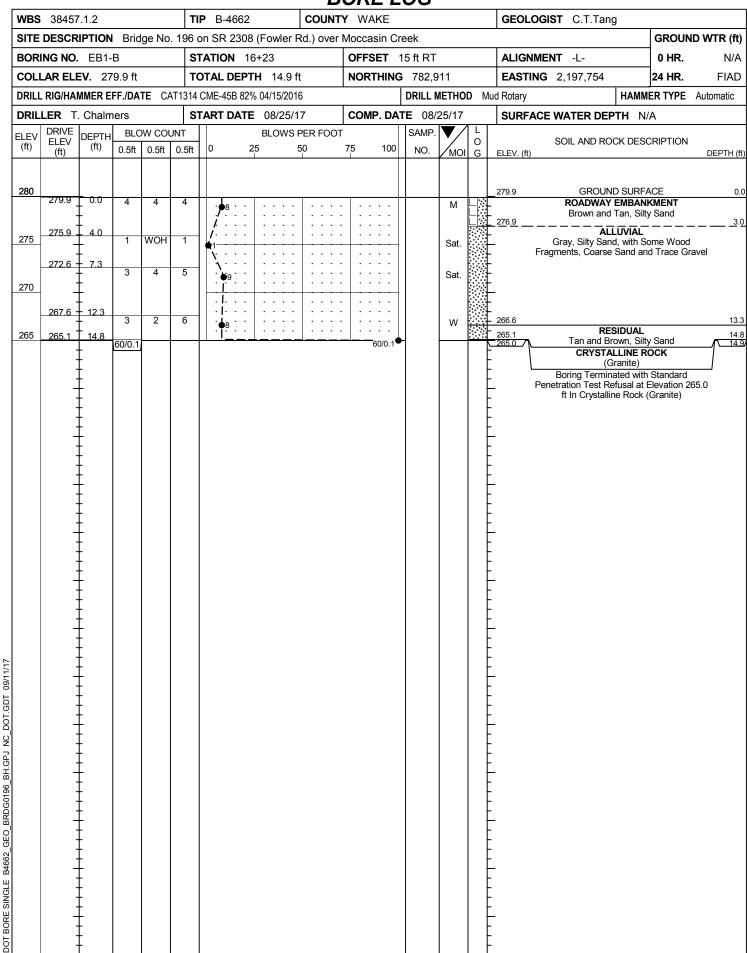
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9/14/2017

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NCDOT BORE SINGLE

